

## **REMARKS / ARGUMENTS**

### ***Remarks Regarding Objections***

Claims 6-10 and 16-18 have been amended in the manner suggested by the examiner.

### ***Remarks Regarding Rejections under 35 USC §112 (second paragraph)***

Claim 11 has been amended so that “stabilizer” is replaced by “titanium,” which has an antecedent in Claim 1.

Claim 12 has been amended so that “alumina” is replaced by “aluminum compound carrier,” which has an antecedent within Claim 12.

### ***Remarks Regarding Rejections under 35 USC §102(b)***

Claims 1 – 18 were rejected as being anticipated by the reference Shoji et al., U.S. Patent No. 5,773,589, hereinafter referred to as “Shoji.” Shoji discloses a catalyst which comprises alumina, from 0.5% to 25% calcium oxide, and from 3% to 20% nickel (claim 2 of Shoji). In these respects the Shoji catalyst resembles the catalyst claimed in the present application. However, in the present application the claimed catalyst comprises, in addition, from about 0.01 wt% to about 20 wt% of titanium. Titanium is not mentioned in Shoji except in the following sentence:

The catalysts may contain, as impurities or additives, alkali metals such as potassium, alkaline earth metals such as barium, magnesium, and strontium, Group IIIA elements of the Periodic Table such as gallium and indium, and other elements such as lanthanum, silicon, titanium, and zirconium.

Further, there is no other mention of impurities or additives in Shoji except as noted above.

The examiner states that it is “inherent” that the amount of titanium, whether as an impurity or an intentional additive, would be at least the minimal amount of 0.01% by weight. “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of

circumstances is not sufficient.” (MPEP §2163.07(a) citing *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)) It is not clear to Applicant what extrinsic evidence the Examiner is relying upon to support the argument that the amount of titanium is inherent. There is no indication in Shoji of *how much* titanium might be added to the catalyst, or might be present as an impurity. Based on a very broad reading of Shoji, it would seem that one could just as easily have a catalyst which contains substantially less than 0.01 wt% titanium or substantially more than 20 wt% titanium, both extremes being outside the presently claimed range.

In addition to disagreeing with the examiner's statement that the amount of titanium additive or impurity is *inherently* within the 0.01% to 20% range, we argue that the cited reference is non-enabling. The sentence quoted above, “The catalyst may contain...other elements...” merely elaborates on the word “comprising” found in the claims. It is true that titanium is mentioned specifically, but this is part of a list of ten specific elements (K, Ba, Mg, Sr, Ga, In, La, Si, Ti, Zr); the list expands to about 20 if we include all elements in the mentioned groups of elements. There is no indication that any of these elements would *improve* the catalyst, nor of what amounts of these elements are effective. We argue that this amounts to undue experimentation that would be necessary to discover the beneficial effects of adding between about 0.01% and 20% of titanium.

The examiner also argues that the claimed BET surface area and Ni surface area are inherently met by the catalyst disclosed in Shoji. As Shoji does not disclose any particular values of BET surface area or of Ni surface area, comparison is difficult. There is no evidence in Shoji that BET surface area of the catalyst taught therein exceeds  $4 \text{ m}^2/\text{g}$ , or that the Ni surface area exceeds  $2 \text{ m}^2/\text{g}$ . The Examiner's inherency argument rests merely on the assumption that the catalyst disclosed in Shoji and the catalyst disclosed in the present application are the same catalyst and the same metal amounts. We disagree with this assumption – specifically the assumption that the catalyst is the same catalyst. As is known by those skilled in the art, a catalyst is not only defined in terms of components, but also how those components are treated during the manufacturing process – including order of addition, drying stages, calcination times and temperatures. In the present case, the two processes for manufacture differ in several critical areas, as summarized in the table below:

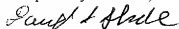
Parameter	Shoji (US 5,773,589)	Present Development
<b>Carrier ingredients</b>	<ul style="list-style-type: none"> <li>• <math>\alpha</math>-<math>\text{Al}_2\text{O}_3</math></li> <li>• calcium aluminate</li> <li>• <math>\text{Al}(\text{OH})_3</math> or <math>\gamma</math>-<math>\text{Al}_2\text{O}_3</math></li> </ul>	<ul style="list-style-type: none"> <li>• <math>\text{Al}(\text{OH})_3</math></li> <li>• Calcium aluminate</li> <li>• Graphite</li> <li>• Water</li> </ul>
<b>Steam treatment of carrier</b>	None	Autoclaved at 20 – 100 psig for about 10 hours
<b>Calcination of carrier</b>	1300°C or higher	8 hours at 120-400°C, then 5 hours at 1250°C – 1350°C
<b>Nickel addition</b>	Single impregnation with nickel nitrate	Multiple impregnations with nickel nitrate, with calcination between impregnations
<b>Calcination of supported catalyst</b>	Dried at 120°C, then calcined at 300°C – 950°C	2 hours at 400°C – 600°C (after each impregnation)

In view of these differences in manufacture of the catalysts, the extrinsic evidence fails to make clear that the missing surface area in the catalyst described in Shoji is necessarily the same as the surface area disclosed in the catalyst of the present application.

Thus, claims 1 – 18 are not anticipated nor obvious in view of Shoji.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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